PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of:

Masaki YANAGIOKA

Appln. No.: 10/599,151

Confirmation No.: 5036

Filed: September 21, 2006

Docket No: Q97138

Group Art Unit: 1763

Examiner: John E USELDING

For: RUBBER COMPOSITION FOR TIRE TREAD AND PNEUMATIC TIRE USING THE SAME

SUBMISSION OF APPEAL BRIEF UNDER 37 C.F.R. § 41.37

Mail Stop Appeal Briefs--Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith please find an Appeal Brief. The statutory fee as set forth in 37 C.F.R. § 41.37 is being remitted. The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

Thomas M. Hunter
Registration No. 64,676

SUGHRUE MION, PLLC
2100 Pennsylvania Avenue, N.W.
Washington, DC 20037
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Date: February 23, 2012

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In re application of:

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APPEAL BRIEF UNDER 37 C.F.R. § 41.37

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Sir:

In accordance with the provisions of 37 C.F.R. § 41.37, Appellant submits the following:

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I. REAL PARTY IN INTEREST

The real party in interest is BRIDGESTONE CORPORATION having a business address of 10-1, Kyobashi 1-chome, Chuo-ku, Tokyo, 104-8340 Japan by virtue of an assignment recorded by the PTO on September 21, 2006, at Reel 018284, Frame 0285.

II. RELATED APPEALS AND INTERFERENCES

Appellants, Appellants' legal representatives, and the Assignee of this application are not aware of any other appeals or interferences that will directly affect, be affected by, or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-7, 10 and 11 are pending.

Claims 8-9 are canceled.

Claims 1-7, 10 and 11 stand rejected, and are the subject of this appeal.

IV. STATUS OF AMENDMENTS

No amendment was filed subsequent to the Final Office Action dated June 23, 2011.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Claim 1 is the only independent claim on Appeal.

Claim 1 is directed to a rubber composition for a tire tread comprising 10-250 parts by weight of a carbon black per 100 parts by weight of a rubber component (page 3, lines 24-26), in which the said carbon black is produced in a carbon black production step using a production furnace wherein a combustion zone, a reaction zone and a reaction stop zone are coaxially connected to each other (page 3, lines 26-29) and including a step of producing a high-temperature combustion gas through the combustion of hydrocarbon fuel in the combustion zone (page 3, lines 29-30), a step of spraying a starting hydrocarbon into the high-temperature combustion gas flow in the reaction zone to convert the starting hydrocarbon into carbon black through partial combustion or thermal decomposition reaction (page 3, lines 30-33) and a step of quenching the high-temperature combustion gas flow with a quenching medium in the reaction stop zone to complete the reaction (page 4, lines 1-2), under conditions satisfying the following relational equations (1) and (2):

$$2.00 \leq \alpha \leq 9.00 \ldots\ldots (1)$$

$$-2.5 \times \alpha + 85.0 \leq \beta \leq 90.0 \ldots\ldots (2)$$

(page 4, lines 2-5) when a residence time from the introduction of the starting hydrocarbon into the high-temperature combustion gas flow to the introduction of the quenching medium is t1 (sec) (page 4, lines 6-8), an average reaction temperature for such a time is T1 (°C) (page 4, line 8), a residence time from the introduction of the quenching medium to the enter of a reaction gas flow into the reaction stop zone is t2 (sec) (page 4, lines 8-10), an average reaction temperature for such a time is T2 (°C), $\alpha = t1 \times T1$ and $\beta = t2 \times T2$)(page 4, lines 10-11),

wherein the carbon black has a hydrogen desorption ratio > $0.260 - 6.25 \times 10^{-4} \times CTAB$ (wt%) (page 4, line 22), a toluene tinting permeability of not less than 90% (page 4, lines 26-27) and a cetyltrimethylammonium bromide adsorption specific surface area

(CTAB) of 111-200 m^2/g (page 10, lines 13-15 and Example 5 as shown in Table 5 on page 19).

Although the above summary refers to specific portions of the specification by page and line number, this is only meant as an example and is not meant to limit the invention in any way.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Appellant seeks review of the following rejection:

Claims 1-7 and 10-11 stand rejected under 35 U.S.C. §102(b) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 6,197,870 to Sakakibara.

VII. ARGUMENT

Appellant respectfully submits that Claims 1-7 and 10-11 are patentable over U.S. Patent No. 6,197,870 to Sakakibara, and request that the Board reverse the Examiner's rejection for the reasons which follow.

Independent Claim 1 of the present application recites:

> A rubber composition for a tire tread comprising 10-250 parts by weight of a carbon black per 100 parts by weight of a rubber component, in which the said carbon black is produced in a carbon black production step using a production furnace wherein a combustion zone, a reaction zone and a reaction stop zone are coaxially connected to each other and including a step of producing a high-temperature combustion gas through the combustion of hydrocarbon fuel in the combustion zone, a step of spraying a starting hydrocarbon into the high-temperature combustion gas flow in the reaction zone to convert the starting hydrocarbon into carbon black through partial combustion or thermal decomposition reaction and a step of quenching the high-temperature combustion gas flow with a quenching medium in the reaction stop zone to complete the reaction, under conditions satisfying the following relational equations (1) and (2):
>
> $$2.00 \leq \alpha \leq 9.00 \text{ ..... (1)}$$
>
> $$-2.5 \times \alpha + 85.0 \leq \beta \leq 90.0 \text{ ..... (2)}$$
>
> when a residence time from the introduction of the starting hydrocarbon into the high-temperature combustion gas flow to the introduction of the quenching medium is t1 (sec), an average reaction temperature for such a time is T1

> (°C), a residence time from the introduction of the quenching medium to the enter of a reaction gas flow into the reaction stop zone is t2 (sec), an average reaction temperature for such a time is T2 (°C), α = t1xT1 and β = t2xT2,
>
> wherein the carbon black has a hydrogen desorption ratio > 0.260-6.25x10^{-4}xCTAB (wt%), a toluene tinting permeability of not less than 90% and a cetyltrimethylammonium bromide adsorption specific surface area (CTAB) of 111-200 m^2/g.

A. Regarding the §102, anticipation aspect of the rejection, though acknowledging that Sakakibara does not disclose or suggest the claimed hydrogen desorption ratio and toluene tinting permeability requirements, <u>the Examiner asserts that Sakakibara would inherently meet the recited hydrogen desorption ratio and toluene tinting permeability requirements because DBP, compressed DBP, CTAB and TINT of Sakakibara meet the requirements of the claimed invention</u>. See, page 3 of the Office Action dated June 23, 2011.

The Examiner has failed to meet the burden necessary to base the rejection on the theory of inherency.

Inherency cannot be based on possibility or probability, but must necessarily flow from the teachings of the applied prior art. The Board has held that in order to rely on the theory of inherency, "the [E]xaminer must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic <u>necessarily</u> flows from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original) (Applicant's invention was directed to a biaxially oriented, flexible dilation catheter balloon...The Examiner argued that Schjeldahl's balloon was inherently biaxially oriented. The Board reversed on the basis that the Examiner did not provide objective evidence or cogent technical reasoning to support the conclusion of inherency.).

Moreover, according to the Court in *In re Rijckaert, infra*, the mere fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993) the (Court reversed the rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art). That is, to establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999).

In rejecting the claims over the cited art, the Examiner acknowledges that Sakakibara does not disclose the hydrogen desorption ratio and toluene tinting permeability requirements. However, the Examiner states that "[t]he Office takes the position that Examples 4-7 [of Sakakibara] would inherently meet [these] limitation[s]." See pages 3 and 4 of the Office Action dated June 23, 2011. In this regard, the Examiner bases his position on the assertion that the four physical property tests (DBP, compressed DBP, CTAB and TINT) taught by Sakakibara do meet the claimed limitations.

That is, the Examiner argues that since the DBP, compressed DBP, CTAB and TINT tests of Sakakibara yield results within the claimed limitations, Sakakibara's carbon black must also meet the claimed hydrogen desorption ratio and toluene tinting permeability requirements. However, the Examiner provides no objective evidence or cogent technical reasoning to support his conclusion, as required by both the Board and the Court.

Thus, the Examiner's reliance on the theory of inherency is improper.

In addition, as shown in Appellant's Declarations under 37 C.F.R. §1.132, submitted on November 24, 2009 and March 30, 2010, the carbon blacks in Examples 4-7 of Sakakibara do not necessarily satisfy either of (1) a hydrogen desorption ratio >

0.260-6.25x10-4xCTAB (wt%), or (2) a toluene tinting permeability of not less than 90%.

Moreover, Appellant directs the Board's attention to Table 6 on page 20 in the present application, which shows that embodiments which meet DBP, compressed DBP, CTAB and TINT requirements of the present invention do not <u>necessarily</u> meet the hydrogen desorption ratio and toluene tinting permeability requirements of the present invention. In particular, Comparative Examples 1, 2, 6 and 7 meet the DBP, compressed DBP, CTAB and TINT requirements, but do not meet the hydrogen desorption ratio requirement, and Comparative Examples 4 and 5 meet the DBP, compressed DBP, CTAB and TINT requirements but do not meet the toluene tinting permeability requirement.

Finally, as shown in the Declaration under 37 C.F.R. §1.132, submitted on October 24, 2011, in Table 5 of Sakakibara, only Examples 1-3 exhibit good balance of low heat buildup and high wear resistance. However, as shown in the table, *infra*, Examples 1-3 of Sakakibara do not meet the claimed requirement concerning CTAB surface area, and thus they do not comply with all the claimed requirements concerning CTAB surface area, hydrogen desorption ratio and toluene tinting permeability.

	Requirement concerning CTAB surface area in the present claim 1	Example 1	Example 2	Example 3
CTAB surface area (m^2/g)	111-200	75	88	105
Abrasion resistance (LA60)		128	136	133
Loss factor		75	84	98

Further, though Examples 4-8 in Table 5 of Sakakibara do meet the claimed requirement concerning CTAB surface area, the loss factor, which is an index of low heat buildup, is large. Thus, the results demonstrate that the carbon blacks of Examples 4-8 of Sakakibara differ from the claimed carbon black.

Despite the evidence discussed above, the Examiner asserts that Appellants' declaration evidence is insufficient because Appellants use a different reactor for making carbon black than is used in Sakakibara. See, page 5 of the Office Action dated June 23, 2011.

Appellants respectfully submit that the Examiner's position lacks merit.

Sakakibara relates to the structure and distribution of carbon black, and as such, the shape of the furnace (FIG. 3) is important. In contrast, with respect to the surface characteristics of the carbon black defined in the present invention, the residence time and the temperature in the furnace are important.

More particularly, the basic characteristics of carbon black, i.e., surface area and structure, are mainly determined at the start of the reaction, while the hydrogen content is a function of the residence time in the reaction zone, i.e., heat history in the furnace, and in particular, the residence time and the temperature in the furnace. See, e.g., the disclosure beginning at page 3, line 16 in the present application.

Sakakibara does disclose the residence time, and the carbon blacks in the Appellants' Rule 132 Declarations filed November 24, 2009 and March 30, 2010 were prepared utilizing the residence times of Examples 4-7 of Sakakibara. However, Sakakibara does not disclose the temperature, and the Declarant had to assume the temperature based on the CTAB surface area, and other disclosed properties.

Since the carbon blacks in the Appellants' Declarations filed November 24, 2009 and March 30, 2010 were prepared by adjusting the residence time and the temperature in the furnace, which control the surface characteristics of the carbon black, any minor difference in the shape of the furnace has no effect on the surface characteristics. Accordingly, Appellants' Declarations of November 24, 2009 and March 30, 2010 properly demonstrate that the carbon blacks in Examples 4-7 of Sakakibara are outside of the scope of the claimed invention.

Accordingly, the Examiner has not shown that Sakakibara necessarily meets the claimed invention, as is required for anticipation based on inherency.

B. Regarding the §103, obviousness aspect of the rejection, the Examiner asserts that the claimed properties would have been obvious in view of Sakakibara. That is, with regard to the hydrogen desorption ratio and the toluene tinting permeability, the Examiner asserts that since these tests are used to determine the physical properties of the carbon black, and Sakakibara teaches several types of tests that are used to determine the physical properties of the carbon black, which physical properties of the carbon black have an effect on good wear resistance and heat buildup, one skilled in the art would be would be motivated to optimize the properties for good wear resistance and heat buildup. See pages 2 and 3 of the Advisory Action dated November 3, 2011.

The Examiner's position lacks merit.

<u>Sakakibara does not even discuss the hydrogen desorption ratio or toluene tinting permeability, so those requirements cannot be considered result-effective variables in Sakakibara.</u> Thus, the claimed ranges are not obvious over Sakakibara.

In addition, a long heating time is typically required to produce carbon black having a large CTAB surface area as defined in the present invention. However, the long heating time inevitably makes the hydrogen desorption ratio of the resulting carbon black small.

In this regard, the inventors of the present invention focused their attention on a cooling step, and thereby produced carbon black having a large CTAB surface area, while maintaining the desired hydrogen desorption ratio. Thus, by compounding the presently claimed carbon black into a rubber composition, excellent balance of low heat buildup and good wear resistance of the rubber composition can be accomplished.

In contrast, the carbon blacks of Examples 1-3 in Table 5 of Sakakibara have a small CTAB surface area as shown above, so a long heating time was not required to produce such carbon black, and thus the hydrogen desorption ratio of Sakakibara's carbon black would be maintained.

In this regard, Mr. Yanagioka's Rule 132 Declaration filed October 24, 2011 shows a relationship between the hydrogen desorption ratio and CTAB surface area of the carbon black and the wear resistance and low heat buildup of the rubber composition.

More particularly, as shown, when the CTAB surface area is 111-200 m2/g, and the hydrogen desorption ratio is larger than 0.260-6.25x10-4 x CTAB (wt%), the high wear resistance and low heat buildup of the rubber composition can be simultaneously established. Further, even when the hydrogen desorption ratio is larger than 0.260 - 6.25 x 10-4 x CTAB (wt%), if the CTAB surface area is less than 111 m2/g, the wear resistance of the rubber composition deteriorates.

One skilled in the art would not expect the results obtained according to the present invention, given the disclosure of the cited art.

In view of the foregoing, Appellant respectfully requests the Board to reverse the rejection of Claims 1-7 and 10-11 based on Sakakibara.

The fee required under 37 C.F.R. § 41.37(a) and 1.17(c) is being remitted. The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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Registration No. 64,676

SUGHRUE MION, PLLC
2100 Pennsylvania Avenue, N.W.
Washington, DC 20037
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

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Date: February 23, 2012

CLAIMS APPENDIX

CLAIMS 1-7, 10 and 11 ON APPEAL:

1. A rubber composition for a tire tread comprising 10-250 parts by weight of a carbon black per 100 parts by weight of a rubber component, in which the said carbon black is produced in a carbon black production step using a production furnace wherein a combustion zone, a reaction zone and a reaction stop zone are coaxially connected to each other and including a step of producing a high-temperature combustion gas through the combustion of hydrocarbon fuel in the combustion zone, a step of spraying a starting hydrocarbon into the high-temperature combustion gas flow in the reaction zone to convert the starting hydrocarbon into carbon black through partial combustion or thermal decomposition reaction and a step of quenching the high-temperature combustion gas flow with a quenching medium in the reaction stop zone to complete the reaction, under conditions satisfying the following relational equations (1) and (2):

$$2.00 \leq \alpha \leq 9.00 \text{ ..... } (1)$$

$$-2.5 \times \alpha + 85.0 \leq \beta \leq 90.0 \text{ ..... } (2)$$

when a residence time from the introduction of the starting hydrocarbon into the high-temperature combustion gas flow to the introduction of the quenching medium is t1 (sec), an average reaction temperature for such a time is T1 (°C), a residence time from the introduction of the quenching medium to the enter of a reaction gas flow into the reaction stop zone is t2 (sec), an average reaction temperature for such a time is T2 (°C), α = t1xT1 and β = t2xT2,

wherein the carbon black has a hydrogen desorption ratio > $0.260-6.25\text{x}10^{-4}$xCTAB (wt%), a toluene tinting permeability of not less than 90% and a cetyltrimethylammonium bromide adsorption specific surface area (CTAB) of 111-200 m^2/g.

2. A rubber composition for a tire tread according to claim 1, which is compounded with the carbon black produced in the carbon black production step that the α value and the β value satisfy the following relational equations (3) and (4):

$3.00 \leq \alpha \leq 8.00$ ..... (3)

$-2.5x\alpha + 85.0 \leq \beta \leq 86.0$ ..... (4)

3. A rubber composition for a tire tread according to claim 1, which is compounded with the carbon black produced in the carbon black production step further comprising a step of introducing a gaseous body in the reaction zone or the reaction stop zone.

4. A rubber composition for a tire tread according to claim 1, which is compounded with the carbon black having a dibutyl phthalate absorption (DBP) of 40-250 ml/100 g, a compressed DBP absorption (24M4DBP) of 35-220 ml/100 g and a cetyltrimethylammonium bromide adsorption specific surface area (CTAB) of 111-200 m^2/g.

5. A rubber composition for a tire tread according to claim 4, which is compounded with the carbon black having a dibutyl phthalate absorption (DBP) of 95-220 ml/100 g and a compressed DBP absorption (24M4DBP) of 90-200 ml/100 g.

6. A rubber composition for a tire tread according to claim 4, which is compounded with the carbon black having a tinting strength (TINT) > 0.363xCTAB+71.792.

7. A rubber composition for a tire tread according to claim 4, which is compounded with the carbon black having a tinting strength (TINT) < 0.363xCTAB+71.792 and (TINT) > 50.

10. A rubber composition for a tire tread according to claim 1, which is compounded with the carbon black having an extraction amount with monochlorobenzene of not more than 0.15%.

11. A pneumatic tire comprising a rubber composition for a tire tread as claimed in claim 1 in a tread portion.

EVIDENCE APPENDIX:

Pursuant to 37 C.F.R. § 41.37(c)(1)(ix), submitted herewith are copies of three Declarations submitted pursuant to 37 C.F.R. § 1.132 on November 24, 2009, March 30, 2010 and October 24, 2011, which have been entered by the Examiner.

RELATED PROCEEDINGS APPENDIX

Appellants, Appellants' legal representatives, and the Assignee of this application are not aware of any other appeals or interferences that will directly affect, be affected by, or have a bearing on the Board's decision in the pending appeal.